he directed the publication of the volumes of the official "Catalogue," which were compiled by English, French, and German experts; he edited the *Recueil de Travaux,* the *Annales du Service,* the "Mémoires" of the French archæological mission in Cairo, and the *Bibliothèque Egyptologique,* and still found time to write his new books and to revise and re-edit long Egyptian texts. His management of the museum was broad-minded and liberal, and he did a great deal to popularise the collections in it by means of his "Guide," of which, alas! edition after edition has been published without an index!

Maspero's knowledge of Egyptology was colossal, and he was always ready to place it at the disposal of the expert as well as of the layman. He broke through the old rule of only allowing favoured investigators to excavate in Egypt, and often supported personally applications to dig made to the committee by comparatively unknown individuals. He was courteous and helpful to every honest inquirer, and, oddly enough, seemed to go out of his way to help most those who exploited his works and who most reviled his methods and belittled his learning. During the last two or three years of his career in Egypt his action in respect of the native dealers in antiquities was much criticised, and it provoked much angry comment both among natives and Europeans. But his friends knew that the mistakes he made were not due to incapacity or ignorance, but to failing health and overwork. He did his own work well, but in doing that of half a dozen other men he did some of it badly. No French official in Egypt was ever more liked and respected by the natives than Maspero, for they trusted him and regarded him as a friend, and they greatly appreciated his justness. In private life he was a delightful companion, and his stories of Oriental life and character were drawn from a fund of knowledge of the East which seemed to be literally inexhaustible. The charm of his conversation was great. His words were carefully chosen, though his expressions were often archaic and quaint, whilst the little mannerisms and gestures by which they were accompanied well suited the genial nature, the warm sympathy, and the kind-heartedness of the man. In both hemispheres his death will be greatly regretted. Maspero received the D.C.L. from Oxford in 1886, an honorary K.C.M.G. in 1909, and he was elected perpetual secretary of the Académie des Inscriptions et Belles-Lettres in 1914. E. A. W. B.

NOTES.

THE KING has been pleased to approve of the appointment of the Earl of Crawford to be President of the Board of Agriculture and Fisheries.

THE Harben lectures for 1916, on "Rivers as Sources of Water Supply," will be delivered by Dr. A. C. Houston at the Royal Institute of Public Health, 37 Russell Square, W.C., on July 13, 20, and 27, at 5 p.m.

PROF. ARTHUR SMITHELLS, F.R.S., professor of chemistry in the University of Leeds, has received a special appointment for scientific service on the Staff at General Headquarters (Home Forces) with the rank of Lieutenant-Colonel and graded for pay as a Deputy-Assistant Adjutant-General.

THE medical committee of the British Science Guild, under the chairmanship of Sir Ronald Ross, passed the following resolutions at a recent meeting: (1) The medical committee of the British Science Guild views with disfavour the suggestion that has been made by certain district councils to cease watering the streets as a war economy, and is convinced that such a step would be prejudicial to the public health. (2) The medical committee also views with great disfavour the pollution of the streets of London, and of most cities and big towns, by dogs, and considers that the attention of the Government and of municipalities should be called to the possibility of reducing the evil by increasing the tax on dogs and by enforcing by-laws. The committee considers that in towns the tax on one dog should be doubled and a large progressive increase imposed on each additional dog.

THE *Times* announces the death from wounds received in action of Lieut. C. G. Chapman, R.E., at the age of twenty-four. Lieut. Chapman, who had served in more than one of the theatres of war, was the son of Prof. R. W. Chapman, of Adelaide University. He was formerly in the Irrigation Branch of the Survey Department of the Australian Government, and had been in charge of surveying parties which did good work in the Northern Territory and the Daly River country. Since the outbreak of war, when he enlisted as a private, he took part in the survey of Lemnos for the Headquarters Staff, and afterwards passed through the Royal Engineers' School at Chatham.

ATTENTION is directed to the confusion that may be caused by the Summer Time Act in the Meteorological Office Circular, No. 1. In accordance with the Act, the use of Greenwich mean time is not interfered with for meteorological purposes, yet it is inevitable that, unless the standard of time used is always indicated in the record of observations, mistakes will occur, especially as the expression "local time" is often erroneously used as a synonym for the new "Summer Time." The scheme of hours of observation at meteorological stations is international in usage, and alternative schemes for winter and summer were never contemplated. The eight sets of observing hours are given in the Circular, and observers who cannot continue at the old hours are strongly recommended to select from the eight alternatives one which will be convenient both for summer and winter, and to change to that scheme once for all. A list is given of the observatories in the British Isles which have changed their hours of observation since the Act came into force.

A CONFERENCE organised by the Bread and Food Reform League on the national importance of utilising whole cereals in time of war was held in London on July 4. The Government was urged to make the use of whole cereals, especially whole wheat meal and 80 per cent. wheat flour, *i.e.* meal from which the less digestible woody fibre has been removed, much more general than it is at present. In this way it is claimed that not only would the national bread supply be considerably increased, but the public would be provided with a more substantial and nutritious food. The Government was further asked to take action to prevent the abstraction from cereal foods of the germ of wheat and of the strong gluten without notification to the consumer. The questions involved in these resolutions have been before the public on several occasions during the last hundred years, most recently in the form of the "Standard" bread crusade, but the present conditions give them a new significance, and in any case the matter is of real scientific importance. In 1881 the late Sir J. H. Gilbert, in a letter to the Royal Society of Arts, expressed the view that while whole meal bread was undoubtedly beneficial to the sedentary worker, the bulk of the labouring population was better suited by a white bread containing a more concentrated nourishment. The apparent waste involved in the production of white flour is largely illusory, as the offals when fed to stock are merely converted into another form of concentrated food. Modern methods of milling have since introduced another factor, but until rigidly controlled feeding experiments on the human subject have been made, the question must remain controversial.

IT is of high importance to the well-being of our industries that we should gather the views of men who stand at the head of great manufacturing concerns as to the type of man, his education and training, who in their opinion is best fitted to direct them. We welcome, therefore, the experience of so eminent an industrial leader as Sir Robert Hadfield, who, in a recent issue of the *Coal and Iron Trades Review*, has expressed himself on this subject. We have not always had this advantage: nothing in the past has been more discouraging to the directors of our scientific and technical institutions than the apathy, not to say the callous indifference, of all but a few far-seeing employers. This newly-awakened interest doubtless finds its origin in the successful industrial rivalry of the United States and Germany, and if we fail to grip the true reason for its success in the wise and ample provision of general scientific and specialised education we shall miss its vital significance. Yet the burden of Sir Robert Hadfield's message is that of the old adage, *Poeta nascitur, non fit*, that the successful "captain of industry" must have original force of character and gifts of natural temperament; in short, must possess inborn qualities that neither education nor training can bestow, but only develop. It thus becomes the business of the nation to set up what Huxley called "effective capacity-catching machinery," so that no potentially capable child shall wither in neglect. One of the greatest qualities of an organiser is the gift of selection, the ability to pick out the fit man for a given place, and if he has had a sound general education and an effective scientific training he will be in full sympathy with all grades of workers, and alive to the possibilities of each. The qualities of mind leading to scientific discovery are one thing, the gift of invention and application another, and they do not often reside in the same person; they even indicate a different order of mind. A Dalton or a Faraday would not necessarily have made a first-rate organiser of a modern business, but by their patient investigations and their penetrating vision they have made possible the great modern technical developments. The true place for the adjustment of theoretical knowledge to industrial aims and conditions is in the workshop, and if manufacturers were wise and far-seeing they would give ample opportunity to the well-educated young man to acquire this essential experience, and would find abundant reward therein.

THE paper published in No. 3317 of the Journal of the Royal Society of Arts for June 16, by the Right Hon. Sir W. MacGregor, entitled "Some Native Potentates and Colleagues," supplies an admirable example of the methods by which one of our most distinguished colonial officials succeeded in gaining the confidence and affection of the native races under his control. He begins with an account of Thakambau, "the greatest and best-known man of the Fijian race," of whom it may be said that no ruler "ever saw his country transformed by such enormous changes as this Fijian chief saw and assisted in." Sedu, the Papuan, "one of the finest characters I have ever known," met an untimely fate in an ambuscade, and the Garter King-of-Arms has allowed Sir W. MacGregor to quarter a figure of this hero as the dexter supporter of his coat-of-arms. The writer's wide experience enables him to record worthies of other races, such as John Allan, an Australian Aboriginal, and the Alake of Abeokuta in West Africa. In the discussion which followed the reading of the paper the Hon. J. G. Jenkins acknowledged in graceful terms the great services of the writer in the administration of British New Guinea in the early days of the colony.

MOST of the June number of the *Zoologist*, (4), vol. xx., No. 900, is occupied by Capt. Malcolm Burr's highly interesting account of his travels in the Caucasus and the Asiatic territory beyond. His military duties have taken him through a remarkable country, and he is able to record many observations on plants and animals, notably birds and orthoptera. The centre of attraction, from the naturalist's point of view, is Geok Tapa, where Capt. Burr was the guest of that famous collector, Alexander Shelkovinov.

SOME facts bearing on the "struggle for existence," as understood by Darwin, are contributed in a short note, "Sur l'équilibre naturel entre les diverses espèces animales," by A. Pictet in the *C. R. des Séances de la Soc. de Physique et d'Hist. nat. de Genève* (xxxii., 1915, pp. 10–13). The author reckoned that if a pair of white butterflies (*Pieris brassicae*) produce 500 eggs, 99·6 of the larvæ must be destroyed if the numbers of the species remain constant. He then collected all the caterpillars—148 in number—from a certain bush, and found that of these 137 had been parasitised by the small ichneumonoid Microgaster, that 9 died of disease, and that only 2 completed their transformations. From the age of these collected larvæ he believed that twice as many had already perished, and thus arrives at a survival ratio (0·04 per cent.) agreeing with his estimate. The agreement thus reached after several assumptions is perhaps too close to be altogether convincing.

THE January number of the *South African Journal of Science* (vol. xii., No. 6) contains an article on the Sarcosporidia by G. van de Wall de Kock, in which the effect of these obscure protozoan parasites on their mammalian hosts and their probable action in causing various diseases are discussed. Recent work on the life-history of Sarcosporidia is usefully summarised.

IN the Proc. Roy. Soc. Victoria (xxviii., 1916, part 2) Miss G. Buchanan gives the results of a comparative examination of the blood of certain Australian animals, with coloured figures of the various forms of corpuscles. She finds a general decrease in size and increase in number of red cells in ascending through the vertebrate classes, while the lymphocytes decrease in number and increase in size. The reptilian relationship of the Monotremes is suggested by a similarity in the mononuclear corpuscles. Platelets were recognised in mammalia only.

Valuable reports on sponges (calcareous and non-calcareous) from the Indian Ocean have lately been published by Prof. A. Dendy in the "Report to the Government of Baroda on the Marine Zoology of Okhamandal, in Kattiawar" (part ii., pp. 79–146, 10 plates). The specimens described were collected by Mr. J. Hornell in 1905–6. Many of the calcareous species are identical with those from the African coast, while a large proportion of the Tetraxonida and Ceratosa were already known from the seas around Ceylon. The plates show the general aspect and the spicules of the new species; unfortunately, the material was largely unsuitable for histological study, and it is to be hoped that collectors will take to heart Prof. Dendy's exhortation to avoid formalin as a preservative for sponges.

In the recently issued part, No. 4, of vol. v. of the Transactions of the Royal Society of South Africa Mr. F. Eyles contributes a long list of plants collected in southern Rhodesia. His record, which occupies 251 pages and is furnished with a full index, includes representatives of 160 families, 869 genera, and 2397 species. The plants collected are mainly flowering plants and ferns, and details of localities, collectors' names, and numbers are given for each species. The record will prove of value to students of African botany, and especially to those of the Rhodesian flora; it should also serve to encourage others to collect and study the plants of the country.

A study of the geography of the Fox Valley is the first of a series of regional surveys on the State of Wisconsin, U.S.A. Three years ago the Wisconsin Geological and Natural History Survey published an introductory survey devoted to the State as a whole. The present volume (Bulletin xlii., Educational Series, No. 5) is by Prof. R. H. Whitbeck, and, like the preliminary one, is published by the State. The object of the work is educational in the main, and the study of geography in the schools of the district will certainly be helped by the use of this intensive survey of a small region. Physical considerations occupy but a small part of the volume, which is mainly concerned with cities and industries. The requirements of school children appear to have been kept well in view throughout, and yet the book avoids being either trivial or didactic.

The question of the nature and origin of the minute plates that impart the "aventurine" effect to felspars appears to have been finally solved by Olaf Andersen ("An Aventurine Feldspar," *Amer. Journ. Sci.*, vol. xl., 1915, p. 351). The author, after goniometric and optical investigation, adopts Scheerer's view, put forward in 1845, that the substance present is hæmatite. His research covers American albites, oligoclase from Kragerö and Tvedestrand (sunstone), labradorite from Labrador, and several microclines. The plates are found always to be oriented after simple crystal forms, although these forms may not be present in the felspar crystal; but the edges of the plates do not yield simple crystallographic relations. These edges, however, are referred to a mineral with hexagonal or trigonal symmetry. The author believes that Fe_2O_3 was originally present in solid solution in the felspar, either as hæmatite or as a constituent of a ferric compound; a disturbance of equilibrium, perhaps a temperature-change, has caused it to separate out as individual crystals of hæmatite along structural planes of the felspar. The bluish tints of the schillerised moonstones, murchisonites, and labradorites are said to be due, like the blue of the sky, to the "scattering of light by particles smaller than the wave-length of light, and cannot be explained as ordinary interference colours of thin films."

In the Journal of the Washington Academy of Sciences for June 4 Mr. Paul D. Foote, of the U.S. Bureau of Standards, shows how the melting points of metals, *e.g.* tungsten, can be determined from the luminosity of the molten metal. The radiation at absolute temperature θ of a black body between wave-lengths λ and $\lambda + a\lambda$ being taken as $c_1\lambda^{-5}e^{-c_2/\lambda\theta} . d\lambda$, where c_1 and c_2 are constants, that of a metal over the visible part of the spectrum the author represents by $c_1\lambda^{-5}e^{-c_2/\lambda\theta} . \mathrm{A}e^{q/\theta} . e^{c_2p/\lambda} . d\lambda$, where p and q are constants. If $V(\lambda)$ is the visibility of radiation λ, the luminosity of the surface of the metal is

$$\mathrm{A}e^{q/\theta} . c_1\int_0^\infty \lambda^{-5}e^{-c_2/\lambda(1/\theta - p)} . V(\lambda)d\lambda.$$

On writing $1/\theta' = 1/\theta - p$, this becomes

$$\mathrm{A}e^{q/\theta} . c_1\int_0^\infty \lambda^{-5}e^{c_2/\lambda\theta'}V(\lambda)d\lambda,$$

which, with the proper value of $V(\lambda)$, has been shown graphically to reduce to $\mathrm{A}e^{q/\theta} . \mathrm{P}\{(\theta' + \mathrm{B})/(\theta' + \mathrm{C})\}^{\mathrm{D}}$, where P, B, C, D are constants. In the case of tungsten the author shows that the values of the constants are $\mathrm{A} = 0{\cdot}303$, $p = 1{\cdot}04 \times 10^{-5}$, $q = 322$, $c_2 = 14450$, $\mathrm{B} = -106$, $\mathrm{C} = 265$, $\mathrm{D} = 72$, $\mathrm{P} = 1{\cdot}91 \times 10^{-7}$. From Langmuir's observation that at the melting point tungsten has a luminosity of 6994 candles per square centimetre, it is shown that the preceding constants give 3712° as the absolute temperature of the molten surface. This method of determining high temperatures seems likely to prove of great value.

The *Mathematical Gazette* for May contains a paper by Prof. H. S. Carslaw entitled "A Progressive Income Tax," dealing with the complicated system of taxation adopted in Australia. Although the British Chancellor of the Exchequer took his B.A. degree in the Cambridge Mathematical Tripos in 1886, he seems to have so far forgotten all his mathematics that he has imposed taxes at the rates of more than 2500, 5000, or 8000 per cent. on persons whose incomes exceed 1000*l.*, 1500*l.*, or 2000*l.* by a single pound. It would be more correct to say that the rate becomes infinity in the pound at these points of the scale, and the case may easily arise in which a professional man may have to throw up his duties at short notice in order to avoid losing money by earning more. But in Australia they appear to have gone to the opposite extreme, and determined the rate of tax by complicated mathematical formulæ defined by curves of the second and third degrees. Indeed, Prof. Carslaw has to use the integral calculus in the examples that he works. Why cannot Chancellors of the Exchequer bring a little more common sense, as well as *elementary* mathematical knowledge, to bear on income-tax problems? The discontinuities in the *gradient* of the income-tax curve, which the Australians have taken so much trouble to eliminate, are of no very great moment, while the present English discontinuities in the *total amount* of the tax are open to serious objection. With 100*l.* exempt, and rates of 2*s.* 6*d.* on the next 400*l.*, 4*s.* on the next 500*l.*, and 5*s.*, 6*s.*, and 7*s.* on subsequent additions to income of 500*l.*, the average rate on 2500*l.* would be very nearly 5*s.* in the pound, but the man with 2000*l.* who earned an extra 1*l.* would still gain 13*s.* instead of losing more than 50*l.* or 80*l.*

The statement that, since the war began, Germany has succeeded in obtaining her full supply of nitrates by fixation from atmospheric nitrogen lends additional interest to the account of a Swedish company for the same purpose contained in *Dagens Nyheter* (June 8). Eyde's method of obtaining nitrogen from the air by means of an electric arc is relatively dear, and its profits depend on the local price of electrical energy. It has, moreover, been calculated that if all the waterfalls of Europe were to supply energy for this industry alone, this would not result in a greater production than would balance the present yearly increase in the world's need of fertilisers. The Swedish company employs a method invented by Th. Thorssell (formerly technical head of the fertiliser and sulphuric acid factories in Malmö), which method depends on purely chemical processes, and demands only the special treatment of easily accessible raw material; but no details of the process are given in the article. The chief products of the new factory are ammonia, ammonium nitrate and cyanide compounds, saltpetre, and sulphuric acid. The process is said to be of such a character that factories can be installed in most places without requiring any large supply of energy. Experimental work was begun in the autumn of 1911, and during the summer of 1912 the results were approved by the outside experts—Prof. H. G. Söderbaum and Dr. Gustaf Ekman. The company was then set going definitely, and, in spite of difficulties inseparable from an entirely new manufacture, as well as losses by fire, it is now preparing to deliver its products in large quantities, and has for this purpose decided to increase its capital from 3·7 million to 8 million kronor.

PROF. OTTO PETTERSSON, of Holma, Lysekil, Sweden, has devised an apparatus for saving life at sea which presents some features of novelty and interest. It consists of three parts: (1) An ordinary horsehair mattress of the thickness, width, and length which are usual for a ship's berth. This mattress is to form the bottom of what will be a kind of collapsible boat when used for life-saving. (2) Attached to the sides of the mattress, and capable of being folded underneath it when used for sleeping purposes, are two cushions which, when the whole is employed for life-saving, form the sides of the craft and on which its buoyancy depends. In the original model these cushions were filled with the hair of the reindeer—a material much used for such purposes in Scandinavia—but, of course, kopok would be equally serviceable. (3) The stem and stern of the little craft are formed of double layers of impermeable, closely woven waterproofed cloth strengthened by cords sewn in and uniting at the ends of the mattress in a metal ring, to which the rope of a sea-anchor may be fixed. Each seam is strengthened by a layer of india-rubber to keep the water from entering the inner stuffing of the mattress. Between the mattress and the side cushions are two pieces of cloth with holes for putting the arms through. The whole forms a sort of cloak in which one wraps oneself, as in an ulster coat, securing it round the waist. The sea-anchor is taken in one hand and one flings oneself backward into the sea. The anchor is let go and the craft emptied of water by a syringe which is placed at the side and is easily worked by the passenger. Once emptied it will not easily fill again, the sea-anchor keeping the prow against the wind and the waves. The little boat is unsinkable, even when filled with water, and is sufficiently buoyant to carry more than one person. If two or three boats are tied together by the anchor line one sea-anchor will keep them steady. The sea-anchor is an essential part of the apparatus. It consists of a canvas bag sewn on to a metal ring, and is provided with a stout manila rope about 20 m. long. The apparatus is made by K. M. Lundberg, of Stockholm, and has been proved to be very serviceable.

AN article on "Fruits for Health, Strength, and Longevity," which appears in the *Fortnightly Review* for July, though an advocacy of fruitarianism, fails to offer any convincing physiological argument in support of the end in view. Like most productions of its kind it consists of manifest inaccuracies mixed with a modicum of truth. For example, "when a man reaches the age of fifty, especially should he be careful about his diet," is only too true; but that "the juices of oranges and lemons act like magic upon the waste chalky accumulations which bring about the stiffening of the arteries"—in other words, cure arteriosclerosis—is a statement unsupported by experimental evidence in the field of modern therapeutics. Nor is there sufficient evidence to show that eating fish and the flesh of the pig is in any way associated with cancer, scrofula, and tumours. Fruit jellies are said to "possess no nitrogen"! and "*condensed starch* seriously taxes the digestive organs." What is condensed starch? "The action of glucose, like that of cornflour, induces sluggish action of the system and tends to disorganisation, driving consumers to purgatives." Yet many fruits are rich in glucose or sugars readily converted into glucose. Moreover glucose has a mild aperient action on most people. "Utilised over a course of years ripe fresh fruits and their juices will effectually prevent aneurismal dilatations and arterial rupture, which of late years have increased to an alarming extent." It would be interesting to know what medical evidence there is for either of these conclusions.

THE June issue of the Chemical Society's Journal contains a report of a lecture by Dr. F. Gowland Hopkins delivered before the society on May 18 on "Newer Standpoints in the Study of Nutrition." This is the third of a series of lectures delivered by invitation of the council during the past session, the two earlier lectures having been given by Dr. E. J. Russell and by Prof. W. H. Bragg. To the chemist, Dr. Hopkins's lecture is particularly attractive by reason of the large measure of success which the author has achieved in his endeavour to interpret biochemical phenomena in terms of the known reactions and products of organic chemistry. Amino-acids, such as tryptophane, arginine and histidine, glutamic and aspartic acids, derived from the hydrolysis of natural proteins, are shown to be the essential units in the nutrition of animals. If these are provided, together with filtered butter-fat or lard, potato-starch, cane sugar, the requisite inorganic salts, and the mysterious vitamine or food-hormone factor (supplied in the form of a nitrogen-free alcoholic extract of fresh milk), life can be preserved and growth maintained without protein or any nitrogenous compounds of unknown constitution. Interesting experiments have been made which show that the withholding of the aromatic compound tryptophane, or of both arginine and histidine, prevents growth and causes a rapid loss of weight; but glutamic and aspartic acids, which constitute 28 per cent. of the protein molecule (as contrasted with $1\frac{1}{2}$ per cent. of tryptophane), can both be removed without causing loss of body-weight or even any marked retardation of growth; and the removal of histidine and arginine separately does not arrest growth, indicating that these two amino-acids can replace one another in nutrition, and may even prove to be chemically interconvertible.